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ABSTRACT

Automated circulation systems in libraries for the blind are described in this report of research conducted by the Subcommittee on Computerised Booklending of the Round Table on Libraries for the Blind (RTLB) of the International Federation of Library Associations (IFLA). Responses to the RTLB questionnaire from 12 libraries in 9 countries are presented, including statistics on library users, holdings, loans, and personnel, as well as information on the main functions of circulation systems in libraries for the blind. A brief discussion of the need for automated circulation systems is followed by a description of four such systems in the U.S.S.R., Australia, and the Netherlands. Additional information on 13 automated systems planned or in use in the United States is summarized from "Automated Circulation Systems Serving the Blind and Physically Handicapped," by Judith Wanger and others from Cuadra Associates. Functional descriptions of all 17 systems are provided, as well as lists of required hardware and documentation sources. Systems are classified as fully online, semi-online, or batch, and a further distinction is made for systems used solely in libraries for the blind, extensions of public library systems, and systems running on a central site computer. (ESR)

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COMPUTERISATION IN BOOK CIRCULATION SYSTEMS

The Need for Computerisation and
a Survey of Automated Circulation Systems.

A report of the
Subcommittee on
Computerised Booklending

Round table libraries
for the blind

Leipzig, August 1981 Theo van der Greft

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Table of Contents

1. Preface 1

2. framework of the questionnaire 2

3. Evaluation of library response 3

4. circulation systems 6
   4.0.1. reader administration 6
   4.0.2. Bookadministration 7
   4.0.3. bookselection 7
   4.0.4. Check-in 8
   4.0.5. Service to the readers. 9

5. Needs for computerisation 10

6. automated circulation systems. 12

7. existing circulation systems. 14
   7.1. U.S.S.R. MOSCOW 14
   7.2. Australia, South Brisbane 14
   7.3. The hague, The Netherlands 16
   7.4. Ermelo - The Netherlands 17

8. circulation systems in The USA 19
   8.1. DRA-system 19
   8.2. REACH system 19
   8.3. A.S.R system 20
   8.4. Daytona Beach - Florida 21
   8.5. Cincinnati, Ohio 21
   8.6. Montgomery, Alabama 22
   8.7. Austin, Texas 22
   8.8. Nashville, Tennessee 23
   8.9. Milwaukee,Wisconsin 23
   8.10. Lansing, Michican 24
   8.11. Denver, Colorado 24
   8.12. Worcester, Massachusetts 25
   8.13. Albany, New York 25

9. conclusion 26
   9.1. STAND ALONE SYSTEMS 27
   9.2. Public Libary systems 27
   9.3. Central site systems 28

I. PREFACE

The subcommittee on computerised booklending of the RTLB in Boston last year set out to:

- carry out research into the need for automated circulation systems in libraries for the blind.

- make an inventory of existing automated circulation systems in use at different libraries.

To obtain the necessary information, the subcommittee drew up a questionnaire shich was sent to all members of the RTLB. Unfortunately, response to this questionnaire was but meagre. A total number of 12 libraries reacted. This report is based on the replies sent in by the libraries. This report is a result of the replies from the libraries.

In the USA the NLS contracted Cuadra Associates in Santa Monica, California, to study the existing computerised systems in the US. I conferred with Frank Curt Cylke, not sending the questionnaires to the US libraries, but waiting for the results of the Cuadra Associates' study. They will describe the various different system in use in the US. This report has meanwhile been finished and is probably obtainable at the NLS. It is a very practical manual for libraries serving blind and physically handicapped inidividuals, and considering cumputerisation. It gave me a very good view of the different automated systems and their functions.

Our report consists of the following sections.

- framework of the questionnaire

- evaluation of library response.

- functions of the circulation systems currently in use.

- bottlenecks and arguments which lead to plans for automation.

- automated circulation systems currently in use

II. FRAMEWORK OF THE QUESTIONNAIRE

The questionnaire comprised questions about the following subjects:

- Service environment, management.
- The circulation system currently in use .
- Service to the readers.
- Statistics
- Automated circulation systems.

The questionnaire was sent off in January 1981. In March 1981 we sent the libraries a reminder.

III. EVALUATION OF LIBRARY RESPONSE

A total number of 12 libraries from 9 different countries reacted to the questionnaire Table 1 gives a list of the libraries which participated in the enquiry and the code letters by which they may be identified further on in this report.

country	city	code	name of the library
Norway	Oslo	os	The Norwegian Association of the Blind.
Australia	sydney	sy	Royal Blind Society of New South Wales.
Soviet Union	Moscow	mo	Republican central Library for the Blind.
Denmark	Copenhagen	co	Statens bibliotek for Blinde
Netherlands	Ermelo	er	Christelijke blindenbibliotheek
Netherlands	The Hague	ha	Dutch library for the blind
Saoudi Arabia	Riyadh	ri	The regional bureau of the middle East Committee for the Blind.
Brazil	Sao Paulo	sp	Fundacao para o livro do cego No Brasil
New Zealand	Auckland	nz	Royal New Zealand Foundation for the Blind.
Australia		au	National Library for the Blind
USA	New York	ny	Jewish Guild for the blind
Australia	South Brisbane	sb	Public Libraries service

table 1

Allmost all libraries serve blind and partially sighted individuals. Physically handicapped people are served by 7 libraries. 5 libraries serve word blind people and 2 libraries cater for illiterate persons.

Some libraries would like to extend their services and cater for other groups of readers in addition to the reading public they are presently serving. Being seriously hampered by a lack of funds, they are, however, unable to do so. Especially the bigger libraries have to cope with this problem.

Table 2 presents annual data on the number of readers, number of books and circulation figures of the libraries. There are rather small libraries (3000 readers), but also very big ones (10,000 - 15,000 readers). The number of lendings varies from 3000 to 450,000 a year.

library code	number of titles	number of readers	annual number of lendings	annual lendings per reader
os	2900	5000	100,000	20
sy	430	3900	71,400	18
mo	52,500	2000	154,000	10
co	3800	7200	206,000	29
er	4200	2500		
ha	13,500	7300	190,000	26
ri	400	8	500	62
sp	620	750	3300	4
nz	3150	3000	120,000	40
au	3200	11,000	450,000	41
ny	500	2500	11,000	4
sb	1000		6300	

table 2

Most libraries have to cope with a considerable increase in the number of readers (200-500 annually). In some libraries the annual number of lendings is increasing by 20 to 30%. Table 3 sets out the annual increases in the number of titles,readers and lendings.

library code	annual increase of number of titles	readers	lendings
os	200	300	—
sy	—	500	5000 (7.5%)
mo	2000	—	—
co	150	100	30,000 (20%)
er	—	200	—
ha	2000	300	10,000 (5%)
ri	100	3	100 (20%)
sp	100	—	—
nz	150	150	25,000 (10 %)
au	—	—	—
ny	100	500	3000 (25%)
sb	500	—	2000 (20%)

— : figures unknown

table 3

On the basis of the replies submitted, it was rather fifficult to infer how many people were actually working in the lending department of the various libraries. Some libraries gave figures for the total number of staff in their employ. others gave no figures at all. Table 4 shows the number of lending staff and the number of streroom personnel in those libraries on which figures were available.

library	lending-staff	storeroom
os	15.5 (total)	
sy	9	2
co	9.5	16.5
er	10 (total)	
ha	6	11
ri	5	2
sp	1	1
ny	2	1
sb	4	??

table 4

IV. CIRCULATION SYSTEMS

The main functions of circulation systems in use at the libraries are:

- reader administration
- book administration
- book selection
- mailing
- checking in books returned.
- registration of the books returned.
- counting / statistics
- bibliographical and information service to the readers
- interlibrary loans

Not al libraries practise all of the above mentioned functions. This list however comprises all the functions which were carried out at the different libraries. These functions are described in more details in the following paragraphs.

4.0.1. reader administration

All important information about the reader is stated on this card. An important tool in the reader administration is the reader-card. All relevant information about the reader is set out on this card. This information is used as a guide in lending books to the reader in question and to make the address-labels. Generally the elements on the reader-card are:

- readernumber
- Name
- Address (permanent,temporary,correspondence)
- Telephone no.
- Age
- birthdate
- Service level (automatic,request-only,manual)
- Sex
- readerstatus
- Occupation/Profession
- Date of registration
- List of interests
- Date of last lending and return
- Comments
- Requests, Has now, Has had

4.0.2. Bookadministration

The bookadministration includes storing information on the bookcards.

This information is used to assist the readers in making requests and to inform them about the catalogue. The lending-staff uses some information for the bookselection. If a book is a sequel, the preceding and the next booknumber are noted on the card. Generally the following information is found on the bookcard:

- Booknumber
- SISO-number
- Author
- Title
- Box number (opy number
- Narrator
- Date of production
- Producer
- Number of copies
- Annotation
- Length (hours,Number of pages)
- Place of publication
- Publishing house
- Year of publication
- Classification
- Sequel
- Date of lending / return

Generally the information pertaining to the lending administration is put on separate cards. In that case there are catalogue and lendingcards of the books.

4.0.3. bookselection

To facilitate the book selection, the following factors will be taken into account:
- The books a particular reader wishes to read (requests)
- The books which are being sent to the reader (has-now) - The books which a reader has read (has-had).

Selection of books is based on the status of a reader. A request-only reader exclusively reads books which he put down on the requestlists.
Other readers may be served by the lending staff, making a choice out of the lirerature requested. Book selection by the librarian is based on various types of information. The readers's interest and/or the nature/authors of the has-had books play a big part in

the selection.

Circulation of books takes place in various ways.
Calendar service provides for circulation on a fixed calendar schedule.
Turn-around service provides for sending a book to a reader, as soon as the reader returns a book.
Will-call service provides for the dispatch of books whenever the reader asks for them. The maximum number of books which a reader may have at ane time is governed by an administrative limit.

Most lending systems have the possibility to reserve books.

Books which are not in the storeroom will be reserved for the reader who asked for them. Selecting books for readers by a manual system is rather complicated. The big problem is how the librarian is to know which books are on the shelfs. There are systems wherby this information is kept in the bookcards. But there is just one cardsystem, so that only one librarian at a time can consult the bookcards. It may be a solution for each of the librarians to handle a part of the bookfile.

That means lending for a particular reader takes place out of a part of the collection of the available books. Other libraries discover in the storeroom that there are no copies available of certain books. A fresh attempt is made to lend a book.

In mailing books, postal labels are generally pasted onoto the boxes. Such labels may be used several times. The mailingcards are sorted according to shelf number to facilitate retrieval by the storeroom staff. Reminders to readers,which fail to return books to the library are being dispatched by most of the libraries. Some libraries wait for 3 months others for 1 year before sending a reminder.

4.0.4. Check-in

Books which are returned are rewound and checked for possible damage. Most libraries have a temporary shelf on which the books which have just been returned are put. The library staff first try to lend from that temporary shelf. This saves time because books taken from the temporary shelf do not have to be restored to the storeroom.

Book reservations, effected within the framework of maual systems, may be carried out by putting an address label in the empty shelfspace normally taken up by the book requested.

4.0.5. Service to the readers.

Readers of libraries for the blind generally don't come to the library themselves. Contacts with readers will always be maintained by telephone or by post. In most cases librarians will contact readers to learn their requests. After a certain minimum number of requests has been submitted, the reader receives a a form on which to state his requests.

A number of libraries was of the opinion, that the services to the readers could be improved by:

- shortening the turn-around time of the books.
- increasing the number of titles.
- producing an up-to-date catalogue of the bookcollection.

To realise one of these aims, the lending administration has to operate more efficiently, thus saving time for such activities. It appears rather difficult to issue an up-to-date catalogue for the readers. Many libraries have an old catalogue with a number of supplements.

V. NEEDS FOR COMPUTERISATION

The biggest problem most libraries for the blind have to cope with is the substantal increase in the number of readers and the number of lendings. Bottlenecks occur in the storeroom and the lending administration. Observations made by libraries filling out the questionnaire form were:

- Automation would assist us to give better service to our readers and to cope with our planned expansion, especially as regards cataloguing and circulation.

- In our manual system a great deal of information has to be written by hand or typed (book cards, reader cards, address cards, etc) It takes a lot of time and leads to a lot of errors.

- Selecting books for those with request-lists takes up a lot of time because there are often insufficient copies of very popular books. Automation will facilitate the choice of alternatives, mentioned in the lists, etc.

- Better address lists would be kept, routine paperwork would be reduced and double check circulation system would be eliminated. Address labels could be prepared automatically.

- Control of the storeroom would be improved. All librarians would be able to see immediatly which books are available for the readers.

- Circulation to and from the readers could be accelerated.

- Automated circulation systems could make possible efficient inter-library loaning-procedures if one and the same computer is being used by more than one library.

- Readers' catalogues could be kept up-to-date.

  The catalogue could be printed out by the computer or a magnetic tape version of it could be sent to a printing house.

In the report by Cuadra Associates libraries which are now working with an automated circulation system put forth similar arguments. Addition to the library staff had not led to an improvement of the services. The bookselection was being carried out by clerical personnel and the level of service could not be maintained. Addition to the library staff had not resulted in improvements of the service. Clerical personal did the

bookselections and quality of the service could not be maintained.

VI. AUTOMATED CIRCULATION SYSTEMS.

There are four libraries which use a computer for their lending administration. Some libraries have a complete automated circulation system and catalogue system, other libraries just have readeradministration.
Four libraries have concrete plans to purchase an automated circulation system.

Libraries which use computers are:

- Republican Central Library for the Blind (U.S.S.R.)
- Public Library Service (Australia)
- Christian Library for the Blind (Netherlands)
- Dutch Library for the Blind.

A short description of the systems they are using is given on the following pages. This list is completed with circulation systems developed in the USA. This information was found in the Cuadra report. This report may be consulted for additional details.

Before I start to describe the systems, I shall explain some general points about an automated system. What form can it take, what advantages and disadvantages can the different systems have? There are two essentially different systems:
- A batch system
- An online system

A batch system is concerned with processing batches of related data over a defined period of time. The main features of batch processing are automatic input- and output devices. These are under control of a stored program after the devices have been loaded with appropriate data. A disadvantage of a batch system is that it is not possible to directly obtain information from the computer, i.e. lending takes place from a list of available copies which the computer made before. Readernumbers and booknumbers are punched on cards and read into the computer.

An online system is a computersystem giving the users direct access to the computer via terminals. In this way information about readers, books, etc can be updated and queried interactivily.
e.g. a lending is effected directly at the data-base The librarians have a better link-up with the information at the database.

Often there is a combination of online systems and a batch system. Lendings can take place directly (online) but printing of mailing cards can be done in a batch-run.

Terminals are used to feed the data into the computer. In a batch system this is often a card reader. With online systems mainly CRT terminals or typewriters are used. It is also possible to use speech or braille terminals.

VII. EXISTING CIRCULATION SYSTEMS.

Hereunder follows a brief description of computerised systems, taking into consideration the following points:

- Who designed the system? Is it a commercial system or was it developed locally
  Is the system in use at one library only or are there more libraries utilising the same system?
  Is the system installed on an in-house computer or on a central site computer with other users sharing the same computer.
- The characteristics of the system (batch/online). The most important functions of the system. Which information is kept in the computer?
- Hardware configuration
- Available documentation

7.1. U.S.S.R. MOSCOW

The system is in use at the Republican Library for the blind, which serves 19 filials. The system has been developed by "All union Scientific Research Institute and the West German firm Schönherr.

FUNCTIONS

It is an online cataloguing system.

HARDWARE

Microcomputer, constructed on the basis of the microprocessor 8080.

7.2. Australia, South Brisbane

The public Library Service of South Brisbane, Australia has an online circulation system, which is a part of the ORACLE library processing system. There are several public libraries which are going to use this system. Service to visually handicapped persons is provided by the public library.

FUNCTIONAL DESCRIPTION

ORACLE is a computerised library system designed to provide for rapid processing of library materials. The system covers three functions:

cataloguing
circulation
acquisitions

The cataloguing system contains a master file with all relevant information about the books. This information is shared by any number of users. In addition to the the master file there are so called Library's amendment files. These files contain all changes to the bibliographic information in the masterfile, for each user. When a user makes any enquiry, the system obtains the information from the master-file and then proceeds to overlay it with the information made by the user in the amendment file, thereby simulating one unique catalogue card.

The circulation system contains:
A circulationfile where all books ,held by the library are stored.
A borrowerfile containing information about the borrowers, such as name address and the booknumbers which are held by the borrower.
A reservationfile containing all current reservations of books for the borrowers.
A loan history file containing all has-had books of the borrowers.

The information kept in the computer is:

catalogue data
borrowers data + has-now books
circulation book data
has-had booknumbers.

HARDWARE

- control data Cyber 70 Model 72
- 96 k (60 bit) words memory
- 123 k (60 bit) extended memory
- 2,400 Mbyte discs
- line printer
- papertape reader/punch
- communication processor, controlling 90 VDU's

DOCUMENTATION

- introducing ORACLE, library processing in a multi-user environment. Library Board of Queensland Brisbane,1979

7.3. The hague, The Netherlands

The ABC system (Automated Booklending- and Catalogue system for libraries for the blind) is a automated circulation system, in use at the Dutch Library for the Blind. Just one library uses the circulation system. The catalogue system is in use at 2 libraries at the moment and at 3 libraries next year. The software has been developed by the computerstaff of the Dutch Library for the Blind.

FUNCTIONAL DESCRIPTION

It is an online system. The system includes:

a catalogue system
a circulation system for books and periodicals.
an invoice system

The catalogue system contains relevant information about the books held by the libraries. There is a central catalogue file where unique catalogue cards have been stored. Each library has his own sub-catlog file where changes or additions in the central catlogcards are being kept. It is an online multi-user system. All information can be retrieved, enquired and updated directly via terminals.

The circulationsystem is based on a database containing borrower information, book-circulation information and the has-had,has now and requests of the borrowers.

Each borrower can be subscribed for talking books, braille books, braille- and cassette- periodicals. For each borrower there is a addresscard in the central address file. For each subscribtion there is a subscription readerfile keeping the reader information concerning that particular subscribtion (subscribtion date, temporary withdrawn, statistics etc) . Via CRT terminals information about readers, books and the has-had, has now and requests of the reader can be updated and queried. Lending and returning books is done directly into the computer. The computer produces mailing cards, which are attached to the books. Reserving books for a particular reader is also possible.

These books are automatically sent to that reader upon their return.

HARDWARE

- PDP 11/34
- 128 Kbytes memory
- disk drive 63 Mbytes
- multipexer for 16 terminals.
- magnetic tape unit
- line printer
- 9 display terminals
- 4 address-card printers
- 2 barcode readers

DOCUMENTATION

- computer assisted booklending system for the blind, Drs,R.v.Vliet, The Hague Holland.

- Program Development Volume of the ABC system, Th vd Greft, The Hague , Holland.

7.4. Ermelo - The Netherlands

This is a batch system containing borrower information. No circulation applications can be performed with it. The system is developed by a commercial firm, "Alpha computerdiensten".

For catalogue applications the library in Ennelo uses the computer system in The Hague.

VIII. CIRCULATION SYSTEMS IN THE USA

Automated circulation systems in the USA are described in the report: "Automated Circulation Systems in Libraries Serving the Blind and Physically Handicapped: A reference Guide for Planning" prepared by Judith Wanger,Joseph W. Haaf and Ruth N Cuadra, Cuadra Associates, Inc, 1523 Sixth Street, Santa Monica, California 90401. It is the result of a six-month study to develop a practical sourcebook for automation planning, for use by libraries for the blind.

From this report I shall give a enumeration of the circulation systems which are described in this report.

8.1. DRA-system

Online circulation system developed by Data Research Associates, Inc. St Louis. This system is in use at 6 libraries.

FUNCTIONAL DESCRIPTION

This systems provides in equipment and bookcirculation, including automatic selection and check-out. Circulation of magazines to subscribers will be implemented. The system generates statistic reports and collection, borrower and circulation reports. Borrower, book, request, reserve, has-now, has-had. subject, and equipment data can be updated online.

HARDWARE

- PDP 11/70
- memory and discs
- CRT terminals
- line printer
- terminal multiplexer.

8.2. REACH system

System developed by Neoterics, Inc , Cleveland. It is in use at New Jersey Library for the Blind and Physically handicapped.

FUNCTIONAL DESCRIPTION

This system performs all book circulation functions, including automatic selection and check-out. Periodical and equipment circulation is also possible. Borrower,book, request, has-had, has-now data can be updated online. The system produces statistical reports.

HARDWARE

- HP 1000, 2112A Processor
- 64 K memory
- 2 HP disk units 15 Mbytes each.
- 4 CRT terminals
- 1 printer

8.3. A.S.R system

This system is developed by consultants with library experience, for the regional libraries in Pennsylvania. The maintenance and development support is provided by Automated Systems Research and Development, Inc. Murrysville. The system is in use at 2 libraries in Pennsylvania.

FUNCTIONAL DESCRIPTION

The system performs all book circulation functions, including automatic selection. The system supports periodical circulation. Borrower, book, request has- now/had data can be updated online. Statistical reports can be performed.

HARDWARE

- PDP 11/35
- 96K memory
- 3 disc units 20 Mb each
- tape drive
- 10 CRT terminals
- 2 print terminals
- printer

8.4. Daytona Beach - Florida

A new system currently being installed at the Florida regional Library.

FUNCTIONAL DESCRIPTION

The system is currently being developed. Functions which are already realized are: book circulation, automatic check-out. These functions are in batch mode. Planned enhancements include: online facilities, equipment circulation, periodical circulation, OCR equipment and statistical reports.

HARDWARE

- IBM 34
- 96k memory
- hard disk unit 128 Mb
- floppy disk
- IBM 5444 disk unit (5 Mb)
- 3 CRT terminals
- 2 printers
- tape unit

8.5. Cincinnati, Ohio

The system is developed by data processing specialists from the public library. It runs on an in-house IBM computer.

FUNCTIONAL DESCRIPTION

The systems performs book circulation functions, automatic selection. All data can be updated and queried interactively.

HARDWARE

- IBM 5340 System 34
- 128K memory
- disk unit (128 Mb)
- floppy disk
- 4 CRT terminals
- printer

CENTRAL SITE SYSTEMS

A number of libraries have a automated circulation system running on a central site computer. Such a computer is shared with a number of other users. Operation takes place through leased telephonelines. The software is generally developed by computer specialists in conjunction with the library staff. Next systems are in use:

8.6. Montgomery, Alabama

A system that is planned to be developed at the Alabama regional library. The system is developed by data processing personnel from the public library in conjunction with the regional library staff. The computer system which is used is the State Data Processing Service's mainframe computer , located several miles away. Operation takes place by leased telephone lines.

FUNCTIONAL DESCRIPTION

Request, assignments and returns are entered through CRT terminals. Statistics can be produced. Automatic book check-out and equipment- and periodical_ circulation are planned to implement.

HARDWARE

- Univac 90/80 central site computer
- 6 CRT terminals
- 2 printers

8.7. Austin, Texas

System developed by the State Library computer specialists in conjunction with IBM consultants.

FUNCTIONAL DESCRIPTION

The system performs : book circulation, automatic selection. Data are entered via punched cards in batch mode. Retrieval and display of data is possible via CRT terminals. Statistics are possible.

HARDWARE

- IBM 360/40 central site computer
- 12 CRT terminals
- printer
- card reader

8.8. Nashville, Tennessee

TACS (Tennessee Automated circulation system) developed by the State library in conjunction with the regional library staff.

FUNCTIONAL DESCRIPTION

System is currently in state of testing. It will perform : circulation functions. Borrower, book request, has- had/now etc can be updated online.

HARDWARE

- Amdahl 470 computer(central site)
- 7 CRT terminals
- print terminal

8.9. Milwaukee,Wisconsin

This system which have to be implemented yet, has been designed by specialists from the Milwaukee Count Federated Library System Data Processing Department in conjunction with the regional library staff.

FUNCTIONAL DESCRIPTION

System performs: book circulation, automatic selection. Online system: book, request, etc. data can be updated via terminals.

HARDWARE

- 2 Perkin-Elmer 8/32 7/32 computers
- 500 K memory
- 4 disk units (256 Mb each)
- 4 tape drives
- 4 CRT terminals
- 1 printer

8.10. Lansing, Michican

The system has been designed by specialists from the department of education data processing unit in conjunction with the library staff. The system operates through leased telephone-lines.

FUNCTIONAL DESCRIPTION

The system performs all circulation function, automatic book-selection. Borrower, book, request, has-now and has-had data can be updated online. The system produces statistical reports.

HARDWARE

- Honeywell 3200 central site computer.
- A number of CRT terminals

8.11. Denver, Colorado

The system has been designed by data processing specialists from the Colorado Department of Education in collaboration with the Libray staff. Leased telephone lines are used to access a shared computer system.

FUNCTIONAL DESCRIPTION

The system performs: book circulation, automatic selection, check-out. Borrower, book, reserve, request and has- now/had data can be updated online. The system performs statistical reports.
Plans: automated circulation of large-print, periodical and equipment circulation. OCR equipment.

HARDWARE

- HP 3000 series 3 central site computer.
- 2 CRT terminals
- print terminal

8.12. Worcester, Massachusetts

System developed by Honeywell Information systems. In use at the talking book library of Worcester. System operates through leased telephone lines to a shared computersystem.

FUNCTIONAL DESCRIPTION

The system performs: book circulation, automatic selection. Borrower, book, request and has-had/has-now data can be updated. Produces statistical reports.

HARDWARE

- HP 66 central site computer
- 4 CRT terminals

8.13. Albany, New York

System running on a Burroughs mainframe computer of State education department, for the New York State Library.

FUNCTIONAL DESCRIPTION

The system performs bookcirculation. Online data entry. Database transactions and circulation transactions are processed in batch mode.

HARDWARE

- Burroughs B7765 computer (central site)
- 2 disk units (2 Mb)
- tape drive
- 7 CRT terminals
- printer

IX. CONCLUSION

There are 15 different automated circulation systems currently in use at libraries for the blind. 13 of these systems are developed in the USA, 1 system in Australia and 1 in the Netherlands. The systems may be classified in:

- Fully online systems. Borrower, book, request and has-had/now data can be updated, retrieved and queried interactivily by CRT terminals.

- Semi online systems. Borrower, book, request, and has-had/now data are updated in batches Data can be queried via CRT terminals.

- Batch system, all data is processed in batches.

Another classification can be made concerning the computer on which the system was developed.

- The system may be developed on a computer, just available for one or more libraries for the blind (stand alone).

- The system may be developed on a computer of a public library. In most case the system is an extension of the public library system. Online systems operates through leased telephone lines.

- The system runs on a central site computer. In most cases this is a big computer. More users, also other users than libraries, share the same computer. (central site systems).

Next table shows the current circulation systems, classified according to these subjects.

9.1. STAND ALONE SYSTEMS

DRA system Data research Associates St Louis	online
REACH system Neoterics, Inc. Cleveland	online
ASR system AUTOMATED Systems Research and Development, Inc. Murrysville	online
ABC system Dutch library for the Blind The Hague, Holland	online
Daytone Beach, Florida	batch (online being dev.)
Cincinnati, Ohio	online

9.2. Public Libary systems

ORACLE Public Library service South Brisbane, Australia	online
Montgomery, Alabama	online
Austin, Texas	semi- online
Nashville ,Tennessee	online
Milwaukee, Wisconsin	online

9.3. Central site systems

Denver, Colorado	online
Worcester, Massachusets	online
Lansing, Michican	online
Albany, New York	semi online